

Claims

1. A method for reducing surface deformation of gap diode electrodes comprising the step of increasing a vapor pressure of a material in a space between said electrodes, thereby reducing evaporative losses from said surface, whereby surface deformation will be reduced.
2. The method of claim 1 wherein said material comprises a material that exerts a significant vapor pressure at an operating temperature of said gap diode.
3. The method of claim 1 wherein said material comprises a metal.
4. The method of claim 3 wherein said metal is chosen from the group consisting of: Zinc, Lead, Cadmium, Thallium, Bismuth, Tin, Selenium, Lithium, Indium, Sodium, Potassium, Gallium, and Cesium.
5. The method of claim 3 wherein said metal comprises Cesium.
6. The method of claim 1 in which one or both of said electrodes comprise said material in solid form, and wherein said step of increasing a vapor pressure comprises the step of increasing an operating temperature of said gap diode to a value at which a vapor pressure of said material is sufficient to prevent said evaporative losses.
7. The method of claim 6 wherein said material comprises a metal.
8. The method of claim 7 wherein said metal is chosen from the group consisting of: Zinc, Lead, Cadmium, Thallium, Bismuth, Tin, Selenium, Lithium, Indium, Sodium, Potassium, Gallium, and Cesium.
9. The method of claim 7 wherein said material comprises Cesium and wherein said step of increasing an operating temperature comprises the step of increasing an operating temperature to a temperature greater than 30° C.
10. The method of claim 7 wherein said material comprises Cadmium and wherein said step of increasing an operating temperature comprises the step of increasing an operating temperature to a temperature greater than 350° C.

11. A method for reducing evaporative losses of electrode material from one or both electrodes of a gap diode device comprising the step of introducing a further material in vapor form into a space between said electrodes, whereby a vapor pressure of said further material reduces said evaporative losses.
12. The method of claim 11 wherein said material comprises a material that exerts a significant vapor pressure at an operating temperature of said gap diode.
13. The method of claim 11 wherein said material comprises a metal.
14. The method of claim 13 wherein said metal is chosen from the group consisting of: Zinc, Lead, Cadmium, Thallium, Bismuth, Tin, Selenium, Lithium, Indium, Sodium, Potassium, Gallium, and Cesium.
15. The method of claim 13 wherein said metal comprises Cesium.
16. The method of claim 11 in which one or both of said electrodes comprise said material in solid form, and wherein said step of introducing a further material in vapor form comprises the step of increasing an operating temperature of said gap diode to a value at which a vapor pressure of said material is sufficient to prevent said evaporative losses.
17. The method of claim 16 wherein said metal is chosen from the group consisting of: Zinc, Lead, Cadmium, Thallium, Bismuth, Tin, Selenium, Lithium, Indium, Sodium, Potassium, Gallium, and Cesium.
18. The method of claim 16 wherein said material comprises Cesium and wherein said step of increasing an operating temperature comprises the step of increasing an operating temperature to a temperature greater than 30° C.
19. The method of claim 16 wherein said material comprises Cadmium and wherein said step of increasing an operating temperature comprises the step of increasing an operating temperature to a temperature greater than 350° C.
20. The method of claim 1 wherein said gap diode is used for tunnel emission of electrons.

21. The method of claim 1 wherein said gap diode is used for thermionic emission of electrons.
22. The method of claim 1 wherein said gap diode is used for field emission of electrons.
23. The method of claim 11 wherein said gap diode is used for tunnel emission of electrons.
24. The method of claim 11 wherein said gap diode is used for thermionic emission of electrons.
25. The method of claim 11 wherein said gap diode is used for field emission of electrons.